Arthroscopic temporomandibular joint disc repositioning using a transmeatal suturing technique: A cadaveric feasibility study

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ABSTRACT

Background: Various arthroscopic discopexy techniques were described for temporomandibular joint (TMJ) disc displacement with a different success rate. One of these techniques is the novel technique introduced by Chi Yang et al in 2012 in which the disc is sutured with the retrodiscal tissues through transmeatal approach. Although this technique is highly successful, it is reported by several operators who tried to apply it to be extremely complex.

Objectives: To assess the feasibility of Yang's arthroscopic discopexy technique for TMJ disc displacement using the transmeatal approach.

Materials and Methods: Yang's arthroscopic transmeatal discopexy technique is conducted on six temporomandibular joints of fresh human cadavers. The feasibility of that technique was assessed by the success rate of the procedure by the same operator.

Results: The technique was successfully performed in two thirds of the joints (n=4) and failure in the remaining one third (n=2).

Conclusion: The technique is feasible but it needs a highly experienced TMJ arthroscopist.

Key Words: Temporomandibular joint, Disc displacement, Transmeatal, Discopexy, arthroscopy.

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through the third puncture into the posterior recess. The suture is put into the 12-gauge needle and it is caught by the lasso and pulled through the third puncture outside the external auditory canal. The 12-gauge needle is retracted from the retrodiscal tissues but still remaining in the joint cavity. The hook-type suture gripper is inserted through the third puncture to catch the other end of the suture and pulled again outside the external auditory canal. The sutures are tied and the knots placed underneath the cartilage of the external auditory canal. Operator determines the success rate of the procedure by counting the number of TMJs in which suturing procedure were successfully performed.

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Table 1 showing the success rate of the suturing procedure

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>%</th>
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<tbody>
<tr>
<td>Success</td>
<td>4</td>
<td>66.7%</td>
</tr>
<tr>
<td>Failure</td>
<td>2</td>
<td>33.3%</td>
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</table>

Figure 2 showing the success rate of the suturing procedure

DISCUSSION:

TMJ disc displacement is a common disorder and affecting a large number of populations worldwide.\[9, 10\] Numerous arthroscopic discopexy techniques have been introduced and developed over years for treatment of disc displacement, however, there have been reports of insufficient success rates and long term disc stability.\[3, 7\] Later in 2012, Yang et al.\[5\] published his novel discopexy technique which had been used in 2167 patients (2622 joints) with a high success rate of 95.42%.\[5\] Yang stated that long term stability of the repositioned disc might be due to the suture anteroposterior traction force instead of lateral forces created by the previous techniques. The anteroposterior traction force of the suture making the disc able to resist the strength of the lateral pterygoid muscle as this traction is consistent with the long axis of the disc.\[11\] Moreover, complete release of the anterior attachment of lateral pterygoid muscle is an important factor for easy and stable disc repositioning in that technique.\[12\]

Although this technique has a high success rate, it is a complex procedure and need specific custom made suture instruments which includes a 12-gauge suture needle and a pair of self-designed suture grippers (a lasso-type and a hook-type) which are expensive and difficult to obtain.\[7, 8\] Due to this complexity of the technique, Yang\[6\] published a new article in 2017 to introduce his surgical procedures step by step to be easier but operators still reported that technique one of the most challenging to perform.\[7\] So we conducted this technique on six fresh human cadavers to evaluate its feasibility.
As reported by other operators, we found that the steps of suturing procedure are difficult especially with the lasso and hook suture grippers which may be due to the different insertion angulation of lasso and hook suture gripper compared to 12-gauge needle. This angulation difference creating difficulty for lasso and hook suture gripper to face 12-gauge needle easily during suture capturing. During the suturing procedure, multiple instruments being used inside the joint space which is small to accommodate these instruments. This creating difficulty to moving easily with the suturing instruments inside the joint space.

CONFLICT OF INTEREST

This clinical study was self-funded by the authors, with no conflict of interest.

CONCLUSIONS:

Yang’s [5] arthroscopic transmeatal discopexy technique is a feasible but it needs a long learning curve due to its high technical difficulty.

REFERENCES


